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1 June 1967

MEMORANDUM FOR: [redacted] PPB

STATINTL

SUBJECT: Comparison of Agency Computers

Attached is a chart giving a very quick comparison of Agency computers. The IBM 360/65 is used as a base with a 1.00 rating.

I can give you an irrefutable argument why each and any figure is incorrect and this should be an adequate caveat. However, software changes can very easily double performance figures in some cases. Software design specifications indicate 3-4 times possible improvement in others. Factors such as these make the figures unreliable.

As one example of the effect of job mix on performance, scientific, compute bound jobs on the IBM 360/65 are processing 5-6 times faster than they do on the IBM 360/50, but I/O bound jobs are processing negligibly faster on the IBM 360/65. Thus, for efficiency purposes, OCS attempts to schedule compute bound jobs on the Mod 65 and I/O bound jobs on the Mod 50. Many of the jobs submitted to OCS consist of several programs or job steps, some of which are compute bound and some of which are I/O bound. Scheduling of these for the most efficient processing is extremely difficult, and many times the primary decision factor is "which machine is least loaded."

Performance indices less than 10 are even less measurable, since these machines generally are designed for a specific market or purpose, and they will perform at a very efficient cost per job when used as per their designs. For example, a CDC 8090 with an index of 1 could dupe a mag tape as fast as a Mod 65. The Mod 65 can do other jobs concurrently, but only if the multitasking and/or spooling software is available.

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Another factor is core, size and mix of I/O devices. A machine may have multitasking software, but if memory is not adequate to hold the extra programs or if I/O devices are not adequate to process the multiple tasks concurrently, the design specifications of the basic hardware/software cannot be realized.

The indices given in the chart do not necessarily correlate too closely with the usual base measurements such as add, multiply, or cycle time. Some machines with very fast add or cycle times manipulate data with cumbersome and time consuming instructions. In the 3rd generation environment wherein much data must be moved internally and externally to keep the CPU occupied, arithmetic operations are not such a dominant factor as formerly.

STATINTL

Director, Computer Center, OCS

Attachment - Chart

Distribution:
Orig. & 1 - Addressee
1 - IPS File
1 - Hardware 3 file
1 - CC/Chrono

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Processing Power of Agency Computers

Machine	Index	Remarks
IBM 360/65	100	Based upon Design Specs rather than May '67 performance.
IBM 360/50	20	" " " " " " "
IBM 360/40	11	" " " " " " "
IBM 360/30	6	" " " " " " "
IBM 7010	8	Powerful internal data manipulation, but I/O no better than IBM 1410. Arithmetic operations are slow.
IBM 1410	3	- - -
CDC 915	1-	- - -
CDC 8090	1	- - -
CDC 1700	10	Evaluation is difficult. Not enough comparison tests available. Specs indicate very fast, but no measurement of data manipulation available.
RCA 501	3	- - -
RCA 301	1	Machine is fast, but the configuration in OCS is minimum.
RCA 70/45	18	- - -
SDS 910	2	- - -
SDS 930	8	- - -
COLLINS 8401	5	Both COLLINS machines are designed for communications switching type processing. A comparison of this type processor with a general purpose processor is a guess.
COLLINS 8561	5	
ITT 9300	-	No specs available
EAI 8800	9	No specs available. Index was derived from other EAI machines using a relative factor.
III GS-3	1-	
LINC-8	1-	

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